

Hercules Incorporated

Remedial Action Report for
Rocky Branch Creek
Floodplain Soils
Vertac Off-Site Areas
Vertac Superfund Site
Jacksonville, Arkansas

July 1998

1761P.04.01

Environmental Resources Management
855 Springdale Drive
Exton, Pennsylvania 19341

047-5179

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This document has been prepared for Hercules Incorporated (Hercules) by Environmental Resources Management (ERM).

SITE BACKGROUND

The Vertac, Inc. Superfund Site (Vertac Site) is located in Jacksonville, Arkansas. Figure 1-1 shows the Vertac Site as it is located relative to the City of Jacksonville. Remedial actions have been taken on the former Vertac plant site and in the designated Off-Site Areas. This Remedial Action Report documents the completion of the Rocky Branch Creek Floodplain Soils component of the Off-Site Areas and has been prepared in accordance with the Unilateral Administrative Order (UAO) for the Vertac Superfund Site Off-Site Areas dated 22 June 1993.

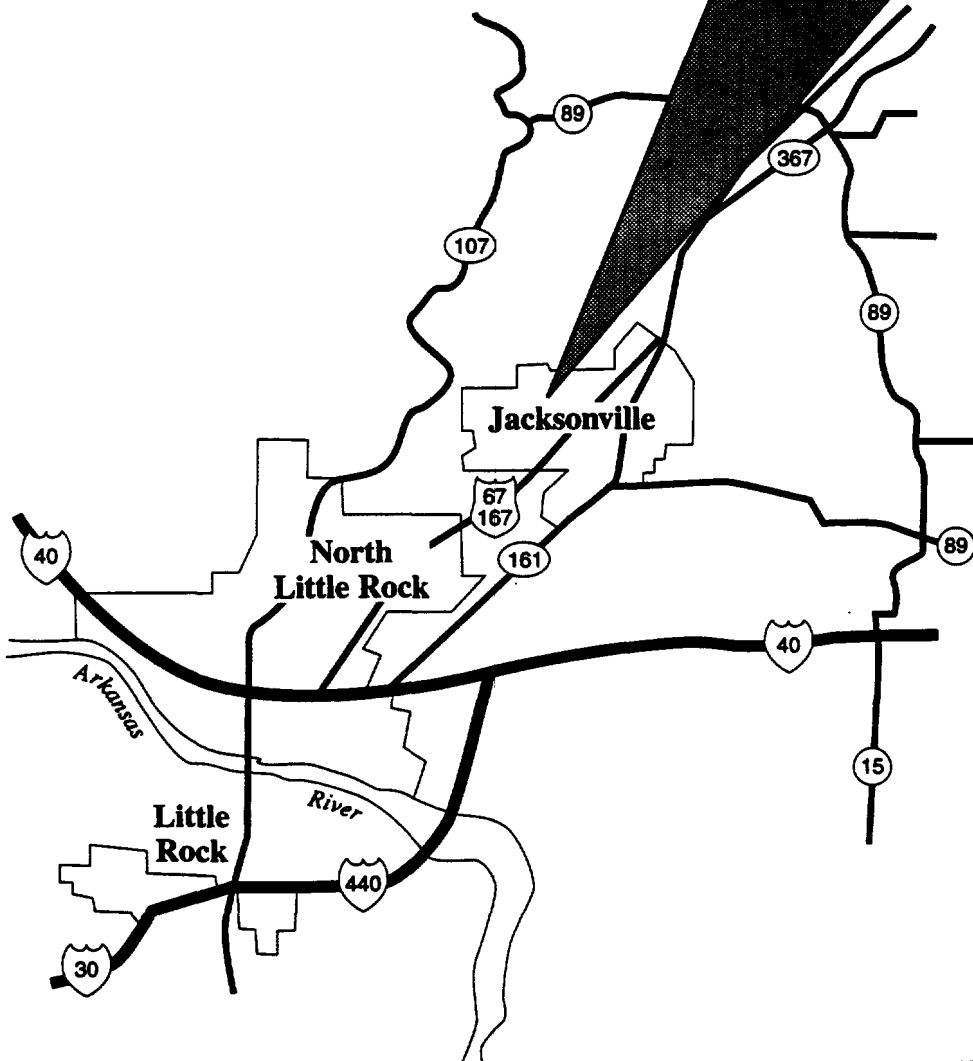
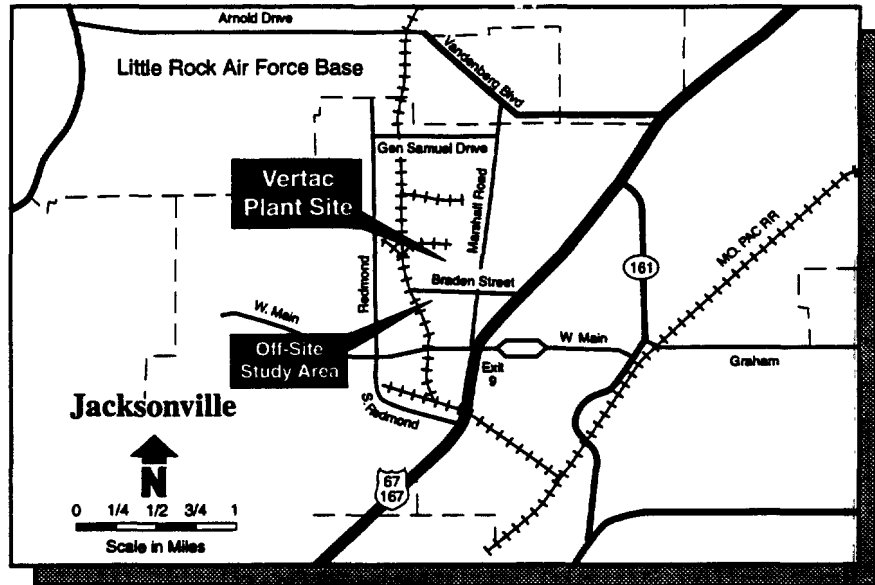
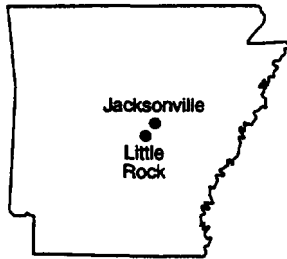
The Vertac Off-Site Areas contaminant of concern is 2,3,7,8 tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD) which is a by-product of the manufacturing process of trichlorophenoxyacetic acid (2,4,5-T), a herbicide product manufactured at the Vertac plant site. Herbicide production began at the Vertac Site in 1948. Prior to that time, the Site was the location of the Arkansas Ordinance Plant. Wastewater collection lines constructed on the plant site in 1941, while it was the Arkansas Ordinance Plant, were connected to the Rocky Branch Interceptor which conveyed wastewater to the City of Jacksonville's Old Sewage Treatment Plant (Old STP) and subsequently to the City's West Wastewater Treatment Plan (WWTP). Rocky Branch Creek, a tributary to Bayou Meto, passes through the plant site property. Overflows of the Rocky Branch Creek interceptor and runoff from the plant site were the suspected source of 2,3,7,8-TCDD contamination found in soils in the floodplain of Rocky Branch Creek downstream of the plant site. Remedial actions were taken in residential areas of the Rocky Branch Creek Floodplain in 1989. Idle portions of the floodplain were left for further remedial investigation.

The UAO defined the Vertac Off-Site Areas to include:

- The active and abandoned wastewater collection lines between the Vertac Plant Site and Old STP and West WWTP;
- The Old STP;
- The West WWTP; and
- The Rocky Branch Creek and Bayou Meto Floodplain and sediments.

**Figure 1-1
Vertac Superfund
Site Location**

Arkansas



A detailed description of the Vertac Off-Site Areas' characteristics is contained in Sections 3 and 4 of the Off-Site Remedial Investigation, Final Report (U.S. Environmental Protection Agency (USEPA), December 1985).

1.2

RECORD OF DECISION AND UNILATERAL ADMINISTRATIVE ORDER

On 27 September 1990, the USEPA issued the Record of Decision (ROD) for the Vertac Off-Site Areas. The ROD selected a remedial action in accordance with CERCLA, as amended by SARA. Following the issuance of the ROD, Hercules negotiated the scope of work with the USEPA to meet the requirements of the ROD. Based on the results of these negotiations, Good Faith Offers to conduct the Remedial Design/Remedial Action were submitted to the USEPA on 5 March 1993.

Subsequently, the USEPA issued the UAO on 22 June 1993 to the Site Respondents to implement the selected remedies. On 9 July 1993, Hercules notified the USEPA that Hercules was unequivocally committed to perform the work described in the UAO to implement the ROD for the Vertac Off-Site Areas. A Statement of Work (SOW) was attached to the UAO which defines the remedial actions for the various components which comprise the Off-Site Areas: the wastewater collection lines, West WWTP, Old STP, Rocky Branch Creek Floodplain, and fish monitoring in the Rocky Branch Creek and Bayou Meto.

The UAO and SOW provided requirements for the performance of the required remedial activities under a CERCLA Remedial Design/Remedial Action (RD/RA) program. This program requires the production of various work plans and management plans to be used by the Respondents in carrying out the remedial actions for the components listed above. This Remedial Action Report has been prepared in accordance with the UAO and SOW to document the completion of the Remedial Action activities for the Rocky Branch Creek Floodplain. Previously submitted construction completion reports have documented the completion of remedial actions for the wastewater collection lines (dated 9 February 1995) and the Old STP and West WWTP (dated 2 January 1996) components.

1.3

SCOPE OF THE REMEDIAL ACTION

The Rocky Branch Creek Floodplain includes the residential zoned area south of the Vertac property line and north of the fork in Rocky Branch Creek between its east leg and main stem. This confluence is located approximately 450 feet north of Main Street in Jacksonville. The Rocky

Branch Creek Floodplain and other Off-Site Areas components are shown on Figure 1-2. The remedial actions required by the SOW are as follows:

- Soils shall be excavated from the floodplain areas that:
 - Contain greater than 1.0 ppb 2,3,7,8-TCDD to a maximum depth of 12 inches; and
 - Contain greater than 10.0 ppb 2,3,7,8-TCDD to a maximum depth of 4 feet or to bedrock if bedrock is shallower.
- Excavated areas that are between 1.0 and 10.0 ppb 2,3,7,8-TCDD shall be covered with 12 inches of clean soil.
- Excavated areas that exceed 10.0 ppb 2,3,7,8-TCDD shall be covered with 4 feet of clean soil or return to original grade, whichever is less.
- Excavated areas shall be regraded and re-vegetated.

A remedial design was completed to carry out this remedy (dated 29 July 1994) and approved by USUSEPA and the Arkansas Department of Pollution Control and Ecology (ADPC&E). Hercules was further instructed in the SOW that unless USEPA notified the Respondents, in writing, to do otherwise, the excavation of contaminated floodplain soils was to be planned so that it took place at approximately the same time as the issuance of the ROD for On-site Operable Unit 2 (OU2). This was to avoid storage of contaminated soil on the Vertac Plant Site. The OU2 ROD, issued in September 1996, provided that the soils excavated from the Vertac Off-Site Areas would be placed in the consolidation/containment cell that had been designed for On-Site Operable Unit 1. The construction of the consolidation/containment cell was completed in the Spring of 1997. The comprehensive remedial action for the Vertac Site was initiated in July 1997 which included the Rocky Branch Creek Floodplain soils removal.

Removal of floodplain soils was started with the implementation of the Remedial Action Sampling and Analysis Plan to delineate the limits of surface soils contaminated above the action levels detailed in the SOW. The area to be sampled included unremediated areas on both east and west sides of the western leg of Rocky Branch Creek at locations where previous sampling events have indicated the potential presence of 2,3,7,8-TCDD at concentrations at or above 1 ppb. Areas of the floodplain were found in those investigations to contain concentrations of 2,3,7,8-TCDD above 1 ppb adjacent to the stream, but the limits of contamination at distance away from the stream channel were not delineated throughout.

Drawing Nos. 1, 2, and 3 of the Remedial Design documents show the grids that were used for the delineation and removal of contaminated soils. Record drawings are attached to this report showing all grids which were remediated and/or sampled during the remedial action.

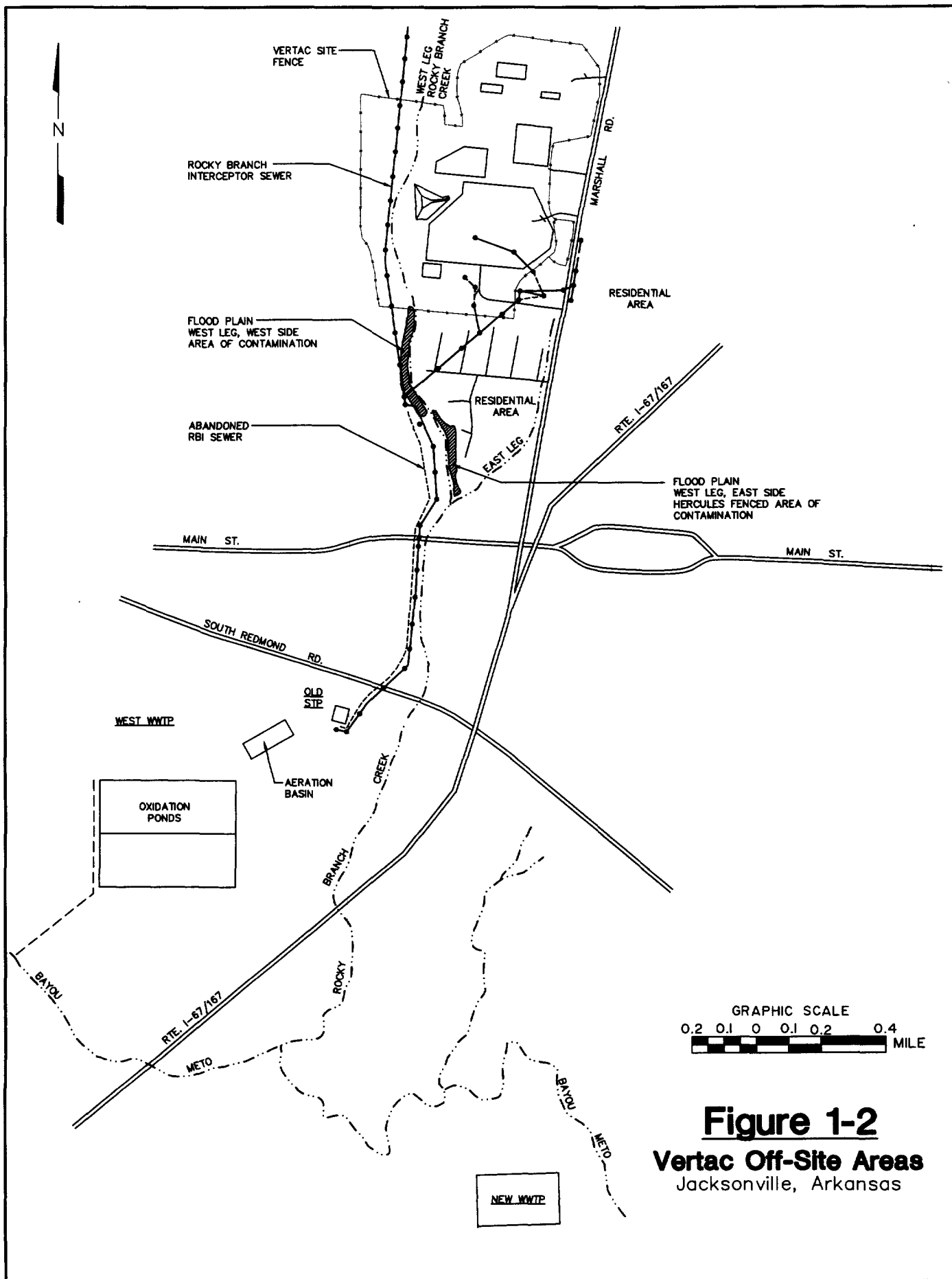


Figure 1-2
Vertac Off-Site Areas
 Jacksonville, Arkansas

This Remedial Action Construction Report includes the items required in the SOW. Section 2 presents a summary of field activities; the Final CQA Report is contained in Section 3; and the appendix contains project photographs. Record drawings are included as an attachment to the report. The required Professional Engineer's Certification is included at the end of this report.

The roles and responsibilities of the major parties involved in the Remedial Action were outlined in the Remedial Action Work Plan dated 29 July 1994. As stated in that document, and as carried out during the Remedial Action, various parties were assigned the following roles as noted:

- The Supervising Contractor was Hercules;
- Robert Knight was the Hercules Construction Manager;
- The Remedial Action Contractor was ENSR;
- The Remedial Action Quality Assurance Official (RAQAO) was ERM; and
- The US Army Corps of Engineers Little Rock District (ACOE) was the USEPA Oversight Contractor. Mr. Todd Hill was their full time on-site representative.

2.1

CONSTRUCTION CHRONOLOGY

The following outline will provide a general sequence of actions taken to remediate the impacted soils along Rocky Branch Creek:

- Week of 16 June 1997 - ENSR notified of intent to award. Pre-Construction meeting scheduled for 9 July 1997.
- Week of 23 June 1997 - Contract signed on 27 June 1997. Mobilization scheduled for the week of 7 July 1997.
- Week of 7 July 1997 - ENSR began mobilization of office trailers, materials and equipment.
- Week of 14 July 1997 - ENSR cleared vegetation along some grids of Rocky Branch Creek.
- Week of 21 July 1997 - No work in Rocky Branch Creek area.
- Week of 28 July 1997 - Started excavation of Rocky Branch Creek Floodplain soils. Approximately half of grid 3-1 and half of grid 4-1 were excavated and hauled to the landfill.
- Week of 4 August 1997 - Continued Rocky Branch Creek Floodplain soil excavation. Grids 1-1, 2-1, 3-1, 4-1, 5-1, 6-2, and 6-3 were excavated. Started clearing on east side of Rocky Branch Creek.
- Week of 11 August 1997 - Cleared trees on the east side of Rocky Branch Creek, prep for excavation.

- Weeks of 18 August 1997 to 22 September 1997 - No Activity.
- Week of 29 September 1997 - Sampling results from east side of Rocky Branch Creek in file.
- Week of 6 October 1997 - No Activity.
- Week of 23 February 1998 - Worked on the east side of Rocky Branch Creek in the floodplain. Loaded out tree stumps and placed topsoil.
- Week of 2 March 1998 - Worked on east and west sides of Rocky Branch Creek in the floodplain placing and grading topsoil.
- Week of 23 March 1998 - Worked on east and west sides of Rocky Branch Creek in the floodplain placing and grading topsoil.
- Week of 30 March 1998 - Completed backfilling and grading of the floodplain excavations. Areas are ready for seeding.
- Week of 6 April 1998 - Seeded floodplain areas on both sides of Rocky Branch Creek.

2.2

CONSTRUCTION MODIFICATIONS

The actual construction varied only slightly from that described in the Remedial Design documents. The limited changes that occurred were the result of site conditions which changed from those existing when the design was prepared.

The principal cause for change in site conditions was a construction project completed in the floodplain just prior to the Vertac Site Remedial Action. A wastewater pipeline serving the Little Rock Air Force Base (LRAFB) was replaced along its original right of way through the Rocky Branch Creek Floodplain. Sampling of the pipeline right-of-way showed that the right-of-way was free of TCDD contamination above the action levels stipulated for the Vertac Off-Site Areas.

Following completion of the sewer replacement project, significant portions of this floodplain between the sewer right-of-way and the Rocky Branch Creek channel became saturated as the result of surface water runoff diversion and the discharge of water conveyed along the sewerage pipeline trench. The resulting soft soils precluded immediate backfilling of excavated grids and subsequently would have precluded achievement of the backfill compaction required in the Remedial Design. In light of these circumstances and the fact that area was backfilled for landscaping

and would never be built upon, backfilled areas received a compaction effort but the density was not tested. This was consistent with the level of effort included in the approved Remedial Design for landscape backfilling in soil remediation areas on the Vertac Site (Operable Unit 2).

3.1

CQA ACTIVITIES

Construction Quality Assurance (CQA) activities carried out for the Residential Areas remediation included pre-excavation sampling, observation of excavation activities, confirming excavation to required removal depths, post-excavation sampling, and observation of backfilling operations.

3.2

SAMPLE COLLECTION AND ANALYTICAL RESULTS

Pre-excavation and post-excavation confirmation sampling was performed by the RAQAO on-site representative in accordance with the Remedial Action Sampling and Analysis Plan contained in the approved Remedial Design for the Vertac Off-Site Areas, dated 29 July 1994. Contract Drawings Nos. 1 through 3 of the Remedial Design illustrate areas of the floodplain previously sampled and established a grid pattern for sampling and remediation. The boundaries of the grid pattern were established in the field by surveying prior to sampling. Some clearing of the floodplain vegetation was required in advance of the grid delineation and sampling.

Soils sampling was performed using a modification of the systematic stratified approach developed by J.H. Exner and used by Roy F. Weston, Inc. (Weston) for their 1992 confirmatory sampling of the floodplain soils. The method entails sampling shallow subsurface soils in grids of 5,000 square feet or less. Within each narrow grid area, two parallel rows of sample nodes were spaced at 10-foot intervals. Around each sample node were three sample locations, designated A, B and C. Soil samples were collected at each sample location at a depth of 0-3 inches. A, B, and C samples were each composited separately for a total of three samples consisting of subsamples from each node in a grid area.

All sample sets collected were sent to Core Laboratories in Indianapolis, Indiana, with the instructions that, from these sample sets, each soil sample collected from the A locations would be analyzed immediately for TCDD. If the first sample result was below the action level of 1.0 pb TCDD, the remaining two samples were to be analyzed to confirm that the grid needed no remediation. Confusion with these instructions led to analysis of all three samples for some grids irrespective of the A sample result. All data is included in this report.

Laboratory Analyses for TCDD were performed in accordance with the Quality Assurance Project Plan using the semi-isomer specific High Resolution Gas Chromatography Tandem Mass Spectrometry method described in "USUSEPA Contract Laboratory Program Statement of Work for Rapid Turnaround Dioxin Analysis, Multi-media", 11/92 Rev. (11/92 USEPA SOW). This method has been used previously for analysis of Vertac Off-Site Areas samples.

The analytical results of all samples taken in the floodplain areas are presented in Table 3-1. Also presented in Table 3-1 is a summary of remedial actions (if any) taken in each sampling grid.

3.3

SOILS EXCAVATION, BACKFILL AND RE-VEGETATION

A number of grids were known, from previous investigation results, to contain surface soils exceeding the 1.0 ppb action level. These grids were adjacent to the Rocky Branch Creek channel as depicted on the Remedial Design Contract Drawings. Soils excavation was initiated in these grids without pre-excavation sampling. Sampling was performed in the grids adjacent to the known-contaminated grids (moving away from the channel) to determine if such additional grids would require excavation, or if a boundary of contamination had been established.

On the west side of Rocky Branch Creek, initial excavations averaged a nominal 6 inches after which confirmation samples were taken. Subsequent excavations, required based on the analytical results of confirmation samples, were carried out in 6- to 12-inch intervals. Excavation was halted when confirmation sample results were below 1.0 ppb TCDD or when the depth of excavation exceeded 12 inches and the concentration was below 10.0 ppb.

On the east side of Rocky Branch Creek, previous investigation had isolated the grids requiring remediation. The decision was made to immediately remove a minimum of 12 inches of soil before sampling to expedite remediation of this area. Samples were taken to confirm that post-excavation TCDD concentrations were below 10.0 ppb, permitting backfilling of the grids with a minimum of 12 inches of soil to complete the remediation.

Surveying was performed during the remedial action to record the amount of soils removal and backfill performed in each floodplain grid. These results are shown on the record drawings attached to this report. Depths of excavation and backfilling are also summarized for each remediated grid on Table 3-1.

Table 3-1 mple Results and Remedial Action Summary
Rocky Branch Creek Flood Plain Soils

Sample	Sample date	Replicate Samples (ppb)					Type	Remedial Action	
		TCDD A		TCDD B		TCDD C			
Property West Side of Rocky Branch Creek									
1-1	07/15/97	0.392		0.666		0.999	Pre-Excavation	Previously elevated TCDD levels remove soils	
1-1	08/12/97	2.123		2.248		3.005	Post-Excavation	Excavated surface soils <1' Remove additional soils	
1-1	08/25/97	0.3	U	1.579		0.544	Pre-Excavation	Excavated soils >1' Backfill and restore	
1-2	07/16/97	0.657		0.3	U	0.339	Pre-Excavation	No Action Required	
2-1	07/15/97	2.83		2.93		2.601	Post-Excavation	Previously elevated TCDD levels remove soils	
2-1	08/12/97	0.813		0.752		1.179	Post-Excavation	Excavated soils >1' Backfill and restore	
2-2	07/21/97	0.468		0.457		0.311	Pre-Excavation	No Action Required	
3-1	08/12/97	1.432		0.3	U	0.3	U	Post-Excavation	Excavated surface soils <1' Remove additional soils
3-1	08/25/97	1.209					Post-Excavation	Excavated soils >1' Backfill and restore	
3-2	07/21/97	0.444		0.366		0.384	Pre-Excavation	No Action Required	
4-1	08/12/97	0.789		1.018		0.987	Post-Excavation	Excavated surface soils <1' Backfill and restore	

U - Under Method Detection Limit as given in preceeding column

Table 3-1 mple Results and Remedial Action Summary
Rocky Branch Creek Flood Plain Soils

Sample	Sample date	Replicate Samples (ppb)			Type	Remedial Action	
		TCDD A	TCDD B	TCDD C			
4-2	07/23/97	0.554	0.748	0.355	Pre-Excavation	No Action Required	
5-1	08/12/97	0.851	1.275	0.801	Post-Excavation	Excavated soils >1' Backfill and restore	
5-2	07/23/97	0.702	0.946	0.754	Pre-Excavation	No Action Required	
6-1	08/12/97	2.051	4.379	5.112	Post-Excavation	Excavated surface soils <1' Remove additional soils	
6-1	08/25/97	2.175			Post-Excavation	Excavated soils >1' Backfill and restore	
6-2	07/23/97	6.425	5.216	6.767	Pre-Excavation	Remove surface soils	
6-2	08/12/97	3.707	2.855	8.87	Post-Excavation	Excavated surface soils <1' Remove additional soils	
6-2	08/25/97	4.183			Post-Excavation	Excavated soils >1' Backfill and restore	
6-3	07/23/97	4.733	5.912	6.32	Pre-Excavation	Remove surface soils	
6-3	08/12/97	1.816	0.486	0.833	Post-Excavation	Excavated surface soils <1' Remove additional soils	
6-3	08/25/97	1.936			Post-Excavation	Excavated soils >1' Backfill and restore	
6-4	10/29/98	0.300	U	0.801	0.624	Pre-Excavation	No Action Required

U - Under Method Detection Limit as given in preceeding column

Table 3-1 mple Results and Remedial Action Summary
Rocky Branch Creek Flood Plain Soils

Sample	Sample date	Replicate Samples (ppb)			Type	Remedial Action
		TCDD A	TCDD B	TCDD C		
Property East Side of Rocky Branch Creek						
E1	11/25/97	2.115			Post-Excavation	Excavated soils >1' Backfill and restore
E2	10/01/97	1.742			Post-Excavation	Excavated soils >1' Backfill and restore
E3	10/01/97	1.546			Post-Excavation	Excavated soils >1' Backfill and restore
E4	10/01/97	2.887			Post-Excavation	Excavated soils >1' Backfill and restore
E5	10/01/97	2.829			Post-Excavation	Excavated soils >1' Backfill and restore
E6	10/01/97	2.755			Post-Excavation	Excavated soils >1' Backfill and restore
E7	10/01/97	0.3	U		Post-Excavation	Excavated soils >1' Backfill and restore
E8	10/01/97	1.946			Post-Excavation	Excavated soils >1' Backfill and restore
E9	10/01/97	1.229			Post-Excavation	Excavated soils >1' Backfill and restore
E10	10/01/97	1.855			Post-Excavation	Excavated soils >1' Backfill and restore

U - Under Method Detection Limit as given in preceeding column

The removal of contaminated soils in the Rocky Branch Creek Floodplain was performed from July through October 1997. Clearing was first done to permit access for delineation of grids and sampling of those grids which were not previously sampled. Grids found to have TCDD concentrations above the 1.0 ppb action level from this and prior sampling were excavated in six inch or greater layers and then resampled to confirm that the remedial objectives had been reached. Soils were removed from eight grids on the west side of Rocky Branch Creek and ten grids on the east side of the stream. A summary of the excavations and backfilling of remediated grids is found in Table 3-1.

Four grids on the west side of Rocky Branch Creek required more than one excavation and confirmation sampling step (see Table 3-1). In those grids, the total excavation depth exceeded 12 inches and confirmation sampling results indicated TCDD concentrations above 1.0 ppb, but below 10.0 ppb. On the east side of Rocky Branch Creek, on property owned by Hercules, remediation was expedited by removing a depth of more than one foot of soil in the first excavation step. Confirmation samples had TCDD concentrations of less than 10.0 ppb. All of these grids were backfilled with a minimum of 12 inches of clean soil to final grade in accordance with the project performance standards.

Backfilling of grids on both the east and west sides of Rocky Branch Creek was hampered by wet conditions that developed in the floodplain. Water surfaced in the floodplain to the west of the soils removal activities and flowed east toward the creek channel across the removal areas. The source of this water was reasoned to be the trench of the Little Rock Air Force Base sewer acting as a subsurface drain collecting ground water from upgradient areas. This wetness delayed backfilling for extended periods and made it impossible to achieve design-specified compaction densities. Compaction efforts were employed to achieve landscape grading densities sufficient to preclude post-construction settlement and support revegetation. This is judged to be acceptable because the portion of the floodplain remediated is anticipated to remain idle in the future and this compaction effort is consistent with the approach adopted in the approved design for soils remediation on the Vertac Site.

Following the completion of backfilling and compaction, all disturbed areas of the floodplain were hydroseeded for stabilization.

The completed floodplain remediation was examined in the Pre-Final Inspection held on 7 May 1998 with USUSEPA and ADPC&E. All excavated areas were observed to have been backfilled and regraded. Vegetation had not been fully established and requires additional monitoring.

Photographs documenting portions of the remedial action in the Rocky Branch Creek Floodplain are included in Attachment A.

As required in Section IX.B, paragraph 61 of the UAO and the SOW, this document includes a certification by a Professional Engineer stating that the remedy component has been constructed in accordance with the UAO and is operating in accordance with the performance standards.

The following certification statement is being provided with the Remedial Action Report for the Rocky Branch Floodplain Soils removal for the Vertac Superfund Site in accordance with the Unilateral Administrative Order for the Vertac Off-Site Areas dated 22 June 1993.

"In my professional opinion, after thorough investigation and to the best of my knowledge, information and belief, the information contained in or accompanying this document is true, accurate and complete. As to the identified portion(s) of this document for which I cannot personally verify its (their) truth and accuracy, in my professional opinion, after thorough investigation and to the best of my knowledge, information and belief, as the Registered Professional Engineer having direct or indirect supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification, that this information is true, accurate and complete.

The construction activities implemented to remediate the Rocky Branch Floodplain Soils has, to the best of my knowledge, been completed in full satisfaction of the requirements of the Unilateral Administrative Order and according to the 29 July 1994 Remedial Design Submittal, Rocky Branch Floodplain Soils. "

Gary B. Emmanuel, P.E.
Project Manager
Environmental Resources Management
Exton, Pennsylvania

Attachment A
Photographs

0-1 155165



The Rocky Branch Creek Floodplain was first cleared of brush in areas of known contamination and adjacent areas that would be sampled to define the limits of contamination.

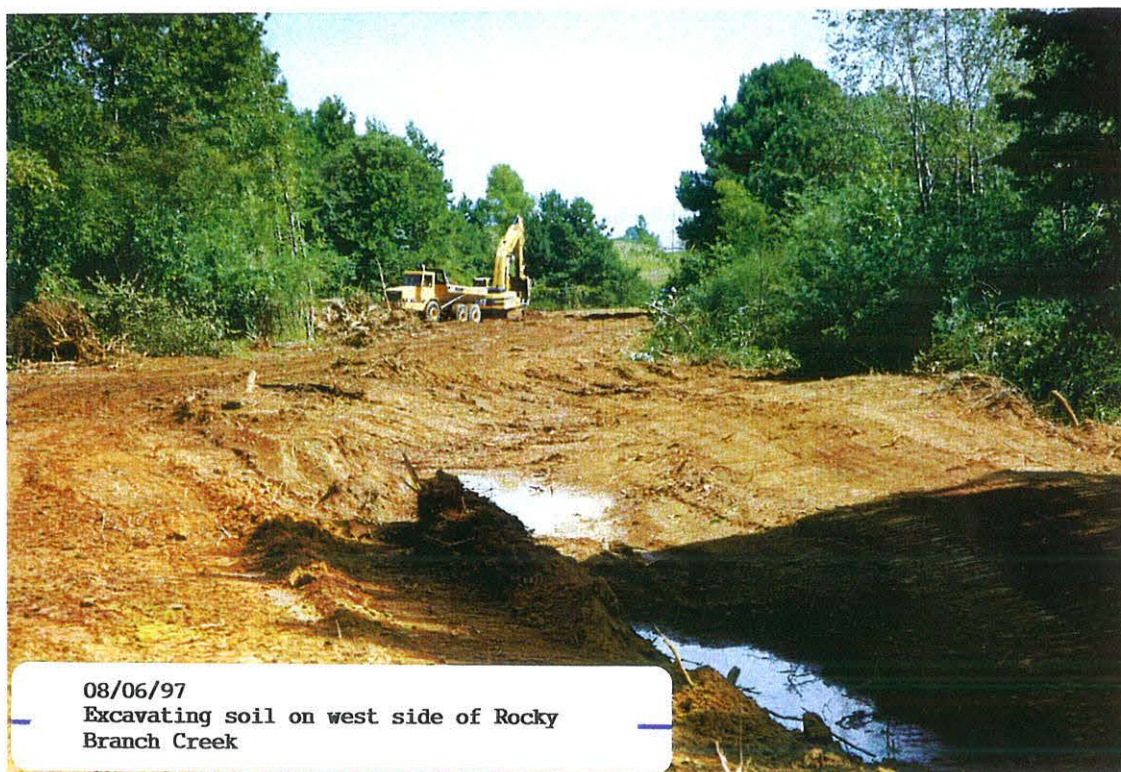


Excavation began in streamside grids. Vegetation was left in place on the stream banks.



08/01/97
Spraying water on flood plain soil to
keep down dust

Water was sprayed to control dust during excavation.



08/06/97
Excavating soil on west side of Rocky
Branch Creek

Excavated soil and vegetation was placed in tri-axle trucks for the relatively short haul to the consolidation/containment cell (landfill) on the Vertac Plant site.



View of backfilled grids 3-1, 3-2, 4-1, 4-2, adjoining clean grids and undisturbed areas on the west side of Rocky Branch Creek. Manholes in the foreground are for the City of Jacksonville's interceptor sewer.



View of backfilled grids E-4 through E-10. The fence surrounds the property owned by Hercules Incorporated.

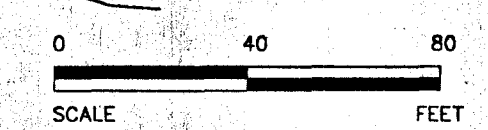
Attachment B
Record Drawings



LEGEND

- APPROXIMATE BOUNDARY OF AREA FOR WEST LEG TO ROCKY BRANCH CREEK THAT IS WITHIN THE 100 YEAR FLOOD PLAIN (AS DEFINED ON THE FLOOD INSURANCE RATE MAP FOR JACKSONVILLE, ARKANSAS, JULY 18, 1985)
- REFINED FLOOD PLAIN BOUNDARY FOR WEST LEG TO ROCKY BRANCH CREEK AS DEFINED BY ERM.
- [Stippled Pattern] AREAS SAMPLED DURING PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE AT OR ABOVE 1 ppb. SOILS REMOVAL COMPLETED AREAS BACKFILLED AND REVEGETATED.
- [Diagonal Line Pattern] AREAS SAMPLED DURING PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE AT OR ABOVE 10 ppb.
- [Dotted Pattern] AREAS SAMPLED IN PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE BELOW 1 ppb.
- [Horizontal Line Pattern] AREAS SAMPLED DURING REMEDIAL ACTION AND FOUND TO HAVE TCDD CONCENTRATIONS BELOW 1 ppb.
- (3-3) CELL DESIGNATIONS (3-3 = CELL 3 - AREA 3)

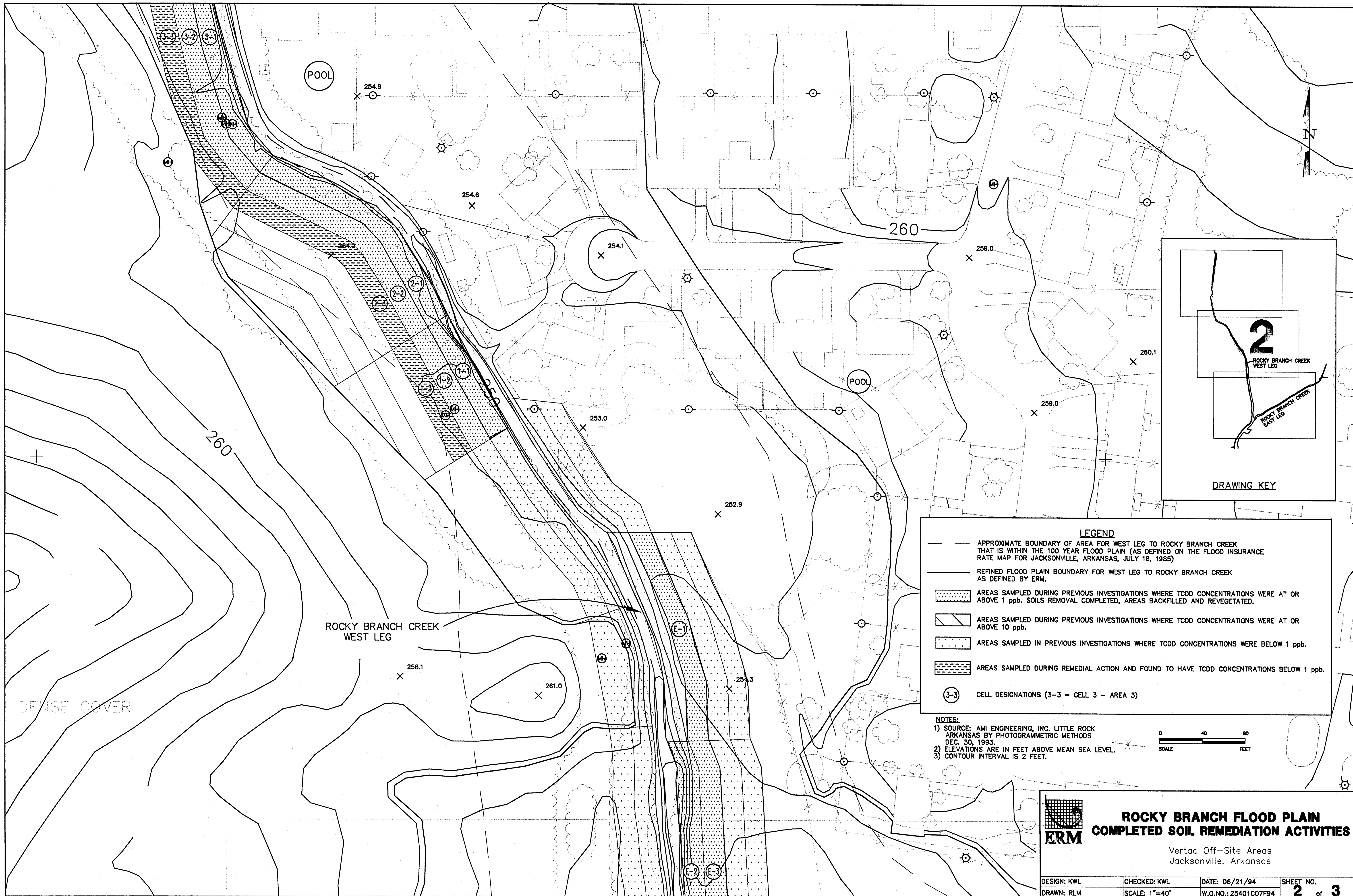
NOTES:
1) SOURCE: AMI ENGINEERING, INC. LITTLE ROCK ARKANSAS BY PHOTOGRAMMETRIC METHODS DEC. 30, 1993.
2) ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
3) CONTOUR INTERVAL IS 2 FEET.



**ROCKY BRANCH FLOOD PLAIN
COMPLETED SOIL REMEDIATION ACTIVITIES**

Vertac Off-Site Areas
Jacksonville, Arkansas

DESIGN: KWL	CHECKED: KWL	DATE: 06/21/94	SHEET NO.
DRAWN: RLM	SCALE: 1"=40'	W.O.NO.: 25401C06F94	1 of 3

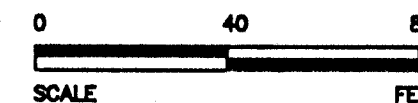


LEGEND

- APPROXIMATE BOUNDARY OF AREA FOR WEST LEG TO ROCKY BRANCH CREEK THAT IS WITHIN THE 100 YEAR FLOOD PLAIN (AS DEFINED ON THE FLOOD INSURANCE RATE MAP FOR JACKSONVILLE, ARKANSAS, JULY 18, 1985)
- REFINED FLOOD PLAIN BOUNDARY FOR WEST LEG TO ROCKY BRANCH CREEK AS DEFINED BY ERM.
- [Stippled pattern] AREAS SAMPLED DURING PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE AT OR ABOVE 1 ppb. SOILS REMOVAL COMPLETED, AREAS BACKFILLED AND REVEGETATED.
- [Diagonal lines pattern] AREAS SAMPLED DURING PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE AT OR ABOVE 10 ppb.
- [Dotted pattern] AREAS SAMPLED IN PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE BELOW 1 ppb.
- [Cross-hatched pattern] AREAS SAMPLED DURING REMEDIAL ACTION AND FOUND TO HAVE TCDD CONCENTRATIONS BELOW 1 ppb.
- (3-3) CELL DESIGNATIONS (3-3 = CELL 3 - AREA 3)

NOTES:

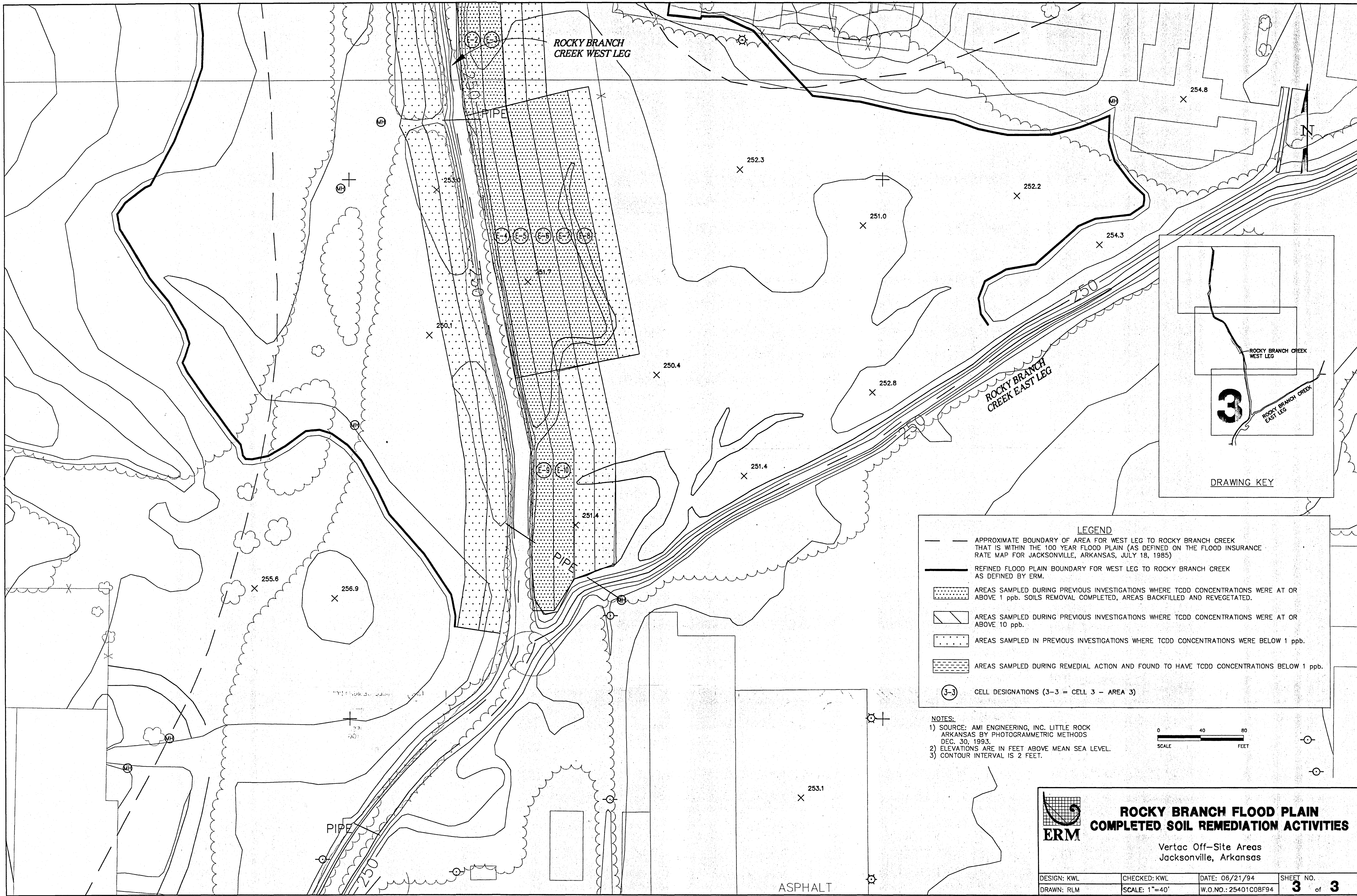
- 1) SOURCE: AMI ENGINEERING, INC. LITTLE ROCK ARKANSAS BY PHOTOGRAMMETRIC METHODS DEC. 30, 1993.
- 2) ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
- 3) CONTOUR INTERVAL IS 2 FEET.



**ROCKY BRANCH FLOOD PLAIN
COMPLETED SOIL REMEDIATION ACTIVITIES**

Vertac Off-Site Areas
Jacksonville, Arkansas

DESIGN: KWL	CHECKED: KWL	DATE: 06/21/94	SHEET NO.
DRAWN: RLM	SCALE: 1"=40'	W.O.NO.: 25401C07F94	2 of 3



LEGEND

— APPROXIMATE BOUNDARY OF AREA FOR WEST LEG TO ROCKY BRANCH CREEK THAT IS WITHIN THE 100 YEAR FLOOD PLAIN (AS DEFINED ON THE FLOOD INSURANCE RATE MAP FOR JACKSONVILLE, ARKANSAS, JULY 18, 1985)

— REFINED FLOOD PLAIN BOUNDARY FOR WEST LEG TO ROCKY BRANCH CREEK AS DEFINED BY ERM.

AREAS SAMPLED DURING PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE AT OR ABOVE 1 ppb. SOILS REMOVAL COMPLETED, AREAS BACKFILLED AND REVEGETATED.

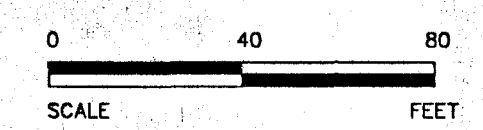
AREAS SAMPLED DURING PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE AT OR ABOVE 10 ppb.

AREAS SAMPLED IN PREVIOUS INVESTIGATIONS WHERE TCDD CONCENTRATIONS WERE BELOW 1 ppb.

AREAS SAMPLED DURING REMEDIAL ACTION AND FOUND TO HAVE TCDD CONCENTRATIONS BELOW 1 ppb.

(3-3) CELL DESIGNATIONS (3-3 = CELL 3 - AREA 3)

NOTES:
1) SOURCE: AMI ENGINEERING, INC. LITTLE ROCK ARKANSAS BY PHOTOGRAMMETRIC METHODS DEC. 30, 1993.
2) ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
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ROCKY BRANCH FLOOD PLAIN COMPLETED SOIL REMEDIATION ACTIVITIES

Vertac Off-Site Areas
Jacksonville, Arkansas

DESIGN: KWL	CHECKED: KWL	DATE: 06/21/94	SHEET NO.
DRAWN: RLM	SCALE: 1"=40'	W.O.NO.: 25401C08F94	3 of 3